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FINAL REPORT
INVENTORY of THREATENED,
ENDANGERED and SENSITIVE
MAMMAL SPECIES
in the
BURLEY BLM DISTRICT

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July, 1980

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CONTENTS

INTRODUCTION	1
STUDY AREA AND GENERAL METHODS	1
Kit Fox	4
Habitat	4
Methods	5
Results	6
Management Recommendations	14
River Otter <i>Lutra canadensis / otters</i>	16
Habitat	16
Methods	16
Results	17
Management Recommendations	19
Lynx	22
Habitat	22
Methods	23
Results	23
Management Recommendations	24
Bobcats <i>Bobcat</i>	25
Habitat	25
Methods	26
Results	26
Management Recommendations	31
Literature Cited	34



Spotted Bat	<i>Bats Enderma</i>	36
Habitat		36
Methods		37
Results		39
Management Recommendations		40
Literature Cited		42
Pygmy Rabbit	<i>Rabbits Leporidae</i>	45
Habitat		45
Management Recommendations		46
Literature Cited		47
Sagebrush Vole		48
Habitat		48
Management Recommendations		49
Literature Cited		50
Rock Squirrel	<i>Squirrels</i>	51
Habitat		51
Management Recommendations		52
Literature Cited		53
APPENDIX I: MAPPED LOCATIONS OF OBSERVATIONS OF CARNIVORES		54
APPENDIX II: IDAHO DEPARTMENT OF FISH AND GAME BOBCAT MANAGEMENT UNITS		58



INTRODUCTION

This report describes results of a survey to determine the presence or absence, distribution, and abundance (both past and present) of four sensitive species of mammalian predators (kit fox, river otter, lynx, and bobcat) on and near BLM administered land in southern Idaho. Survey efforts began in June 1979 and were completed in May 1980.

STUDY AREA AND GENERAL METHODS

The survey was conducted in five BLM Planning Units (PU's). These PU's were Twin Falls, Curlew, Malad Hills, Roy-Arbon, and Pocatello.

Our survey included two general methods: 1) interviews with knowledgeable persons, and 2) our field searches.

Interviews were conducted with biologists from numerous federal and state agencies (US Bureau of Land Management, US Fish and Wildlife Service, US Forest Service, Idaho Fish and Game, Utah Department of Wildlife Resources, Nevada Game and Fish), state Conservation Officers, US Forest Service range personnel, US Fish and Wildlife Service Animal Damage Control personnel, private trappers, fur dealers, and numerous local farmers, ranchers, and residents. The interviews were conducted for the following reasons: 1) to gather both historic and present data on locations of sightings, dens, road kills, and trapped animals, and 2) to determine individual views on how abundant these species are or were and



how this abundance may be changing.

Our field searches utilized four techniques: scent station surveys, spotlighting, predator calling, and actual sign searches.

- 1) The scent station survey technique was developed and is employed annually by the US Fish and Wildlife Service to obtain abundance indices of predators in the western United States. Detailed methods of this technique are described by Linhart and Knowlton (1975). Data gathered using this technique came from both scent station surveys (n=2) operated by WERA personnel and also a review of US Fish and Wildlife Service records on scent station survey results from 1972-79 from within and around the study area.

The validity of using the USFWS designed predator scent station surveys for gathering any data on non-target species (e.g., non-coyote species) other than documentation of presence and multi-year trends is unknown. This survey was designed primarily to follow trends in coyote populations through repeated annual sampling, and although other predators such as bobcats frequently visit scent stations, the actual response by bobcats and other predators to these surveys is unknown (J. Bean, USFWS, pers. comm.).

- 2) Spotlighting was conducted on numerous unimproved roads in all PU's to visually document presence of the four study species. A roof-mounted spotlight (100W aircraft landing light) was used and searches were conducted between 0300-dawn and 2100-2400 hours.



- 3) Sign searches were conducted in likely habitat of each of the four study animals. Species-specific sign (tracks, scats, etc.) are described in each appropriate section later.
- 4) Predator calling/binocular scans were employed during early mornings and evenings in likely habitat of the four study species.

These field search techniques and interviews were conducted in all five study area PU's.

Documented observations of the study species are plotted on maps in Appendix I.



Kit Fox

Distribution of the kit fox (Vulpes macrotis) is closely associated with semi-arid and desert regions of western North America (McGrew 1979). Kit foxes are believed to have been historically present throughout much of the Great Basin Desert (Jaeger 1957), but their current status and actual distribution is incompletely known. Kit foxes of the Great Basin are common throughout Nevada and western Utah (McGrew 1979) but are listed as Endangered by the State of Oregon (Olterman and Verts 1972). Presently, the kit fox is regarded by the Idaho Department of Fish and Game as a "species of special concern" where restricted range, specific habitat requirements and/or low population numbers make them vulnerable to elimination if adverse impacts on populations or habitat occur. No population estimates are available from the Idaho Fish and Game Department.

Habitat - Kit foxes are commonly associated with steppe or desert climates and in areas where native vegetation is shrubby or of a shrub-grass combination. In the Great Basin, this shrubby community generally consists of shadscale (Atriplex confertifolia), greasewood (Sarcobatus vermiculatus), and sagebrush (Artemisia tridentata). McGrew (1977) reported 72 percent of 92 Utah kit fox sightings in areas with less than 20 percent ground cover, light-colored loamy soils, and elevations less than 1675 m. K. Kimber (1979 pers. comm.) has observed kit foxes on sandy soils deposited from glacial actions, usually on mounds slightly elevated



above surroundings in southern Idaho.

Dens are an important ecological feature to this species. Kit foxes appear to prefer areas which already contain dens but when dens are unavailable, a variety of artificial dens have been used (Egoscue 1956, 1962; Morrell 1972; McGrew 1977). Apparently, kit foxes do very little digging of dens themselves but rely on other species to do so. Dens occur in groups, not scattered at random (McGrew 1979), and are used throughout the entire year.

Food habits of the kit fox are varied (Egoscue 1962, Laughrin 1970, Morrell 1972), but the primary item in the diet is usually the most abundant nocturnal rodent or lagomorph in the vicinity of the den. In western Utah, Egoscue (1962) found black-tailed jackrabbits (Lepus californicus) to be the most important prey utilized while McGrew (1977) felt kangaroo rats (Dipodomys spp.) were most important.

Many people feel the loss of suitable habitat (often because of agriculture) is the main reason for the decrease in abundance of kit foxes in western North America (Laughrin 1970, Jensen 1972, Morrell 1972, 1975). Other significant causes of mortality are predator control poisoning, loss of prey, and secondary poisoning effects from rodent control and hunting and trapping.

Methods - Methods employed to gather information on kit foxes in the study area included 1) interviews with knowledgeable persons, and 2) field searches.

Field searches utilized four techniques, all previously



described. Characteristic kit fox sign, such as tracks, scats, and dens (McGrew 1979) were sought and predator calling/binocular scans were conducted in likely areas. Two scent station surveys were also conducted in areas where kit fox presence was suspected. Unimproved roads were spotlighted in areas of potential suitable habitat.

Results - Most information concerning the presence, absence, and abundance of kit foxes within the five PU's was obtained via the interviews with knowledgeable persons. These interviews showed two PU's (i.e., Curlew and Malad Hills) as historically and/or presently harboring kit foxes. Further supporting evidence, in the case of the Curlew PU, came from USFWS scent station data.

Based on this information, field search techniques to document the presence of kit foxes were employed in only these two PU's.

- 1) Curlew PU - Historical information furnished by K. Kimber (Table 1, #22) shows kit foxes residing in the Black Pine (Juniper) Valley during the 1950's and 1960's. These sightings of kit foxes were generally confined to T16SR30E, prior to the exhaustive shrub eradication programs of the late 1960's and subsequent increase in agriculture. Recent sightings (last 10 years) are unavailable. Several other persons interviewed reported that kit foxes were and are still found in southern Curlew Valley, south of Snowville, Utah (Table 1, J. Pratt #23, W. Stephenson #17, B. Stokes #16).



Table 1. cont.
 Table 1.—Information gathered from interviews with knowledgeable persons on 4 sensitive mammal species in the 5 BLM Planning Units.

Planning Unit	Observer	Information
1. Twin Falls	Bill Gorgen, CO Idaho Fish & Game Twin Falls ID	Possible kit fox sighting, 2 river otters reported near Twin Falls on Rock Creek
2. " "	Guy Conley & Roger Nass, Research Biologists, ADC, USFWS, Twin Falls ID	Lions historically numerous in South Hills
3. " "	Kenneth Timothy Wildlife Biologist Humboldt Natl. For. Buhl ID	Mtn. lions historically numerous in Nevada to south of Twin Falls Planning Unit
4. " "	Larry Finney Trapper Buhl ID	"Lions" in Elk Mtn. area of South Hills & has observed sign in Salmon Falls Canyon; possibly kit fox between Callen Ranch along Hwy. 93 & South Hills; observed river otters in Salmon Falls Canyon, Snake River, & Clover Creek; bobcat in Salmon Falls Creek
5. " "	Carl Nellis, Res. Biologist, Idaho Fish & Game, Jerome ID	Lynx from South Hills in Hansen, Idaho, grocery store; provided kill records for mtn. lion; bobcats scattered in foothills
6. " "	Gary Wills Regional game mgr. Idaho Fish & Game Jerome ID	Made available computer printout on incidental sightings of species by location for Region 4
7. " "	Jim Underwood Furbuyer Jerome ID	Has purchased no lynx hides in recent years; otters present in Clover Creek, Salmon Falls Canyon, & purchased one hide from Jackpot, NV, area; bobcats scattered in foothills & along Salmon Falls Canyon



Table 1 cont.

Planning Unit	Observer	Information
8. Twin Falls	Frank Gunnel Wildlife biologist Sawtooth Nat. For. Twin Falls ID	No concrete information
9. " "	Robert Quirox ADC, USFWS Twin Falls ID	Bobcat & mtn. lions present in South Hills and foothills
10. " "	Bill Webb District Supervisor Idaho Fish & Game Jerome ID	River otters in Snake River, Salmon Falls Creek; no kit fox or lynx information; bobcats common but decreasing; a few mtn. lions in South Hills. He provided computerized output on all incidental sightings of 5 study species in Dist. 4. Also all bobcat trapping data.
11. " "	Chuck Gary Conservation Officer Idaho Fish & Game Twin Falls ID	River otter on Rock Creek near Goose Creek confluence; no kit fox or lynx data; bobcats still "relatively common" in foothills of South Hills
12. " "	D. Zuck Idaho Wildl. Fed. Twin Falls ID	No river otter, kit fox, or lynx information. Bobcat & mtn. lion tracks in Snake River canyon NW of Twin Falls
13. " "	T. Scheimeir Taxidermist Twin Falls ID	Believes kit fox not present in Twin Falls P.U.; no information on otters; bobcat population way down but common; mtn. lion scattered in South Hills; one lynx killed near Castleford (SW of Twin Falls) in 1973-74
14. " "	K. Daw, Resident Hansen ID	Killed a female lynx in 1973, 6 mi S of Hansen in a hay field; C. Nellis, Id. Fish & Game, gave positive I.D. Daw reported another lynx killed on same day on N side of Snake River, approx. 8 mi N of Hansen
5. " "	J. Brannon Resident Magic Hot Springs ID	Otters along Shoshone Creek year-round; a litter produced 1978. Bobcats along Shosone Creek canyon



Table 1 cont.

Planning Unit	Observer	Information
16. Curlew	B. Stokes Trapper Snowville UT	Kit fox just S of Idaho border & believes they may also occur in Idaho; no river otter data; a few lion scattered; bobcats down but doing "OK"; he killed a lynx in Bull Canyon, NW of Holbrook in 1940
17. "	W. Stephenson USFWS Trapper Logan UT	Trapper Curlew Valley since 1974 & knows of no kit fox captures; catches 1-2 bobcats annually in coyote sets; bobcat population down but still plentiful; no other information; lions still around in isolated areas
18. Roy Arbon	W. Miller Trapper Rockland ID	One river otter seen in E Fork Rock River in 1978. Bobcats in Deep Creek Range
19. Roy Arbon & Curlew	Mike Worthen ADC, USFWS Rockland ID	Bobcat common in Deep Creek & Sublette Ranges; trapped bobcat in Sec. 15, T11SR32E; reports of lions scattered thru-out mtn. ranges of the areas; no river otters or kit fox
20. Roy Arbon	W. Arms, CO Idaho Fish & Game American Falls ID	No otters around in this P.U., except along Snake River
21. " "	D. Fernan, Trapper American Falls ID	No otter; some bobcat & mtn. lion, on upswing
22. Curlew	Kendall Kimber Retired CO Utah Fish & Game Snowville UT	Numerous kit fox sightings in '50's & '60's in Black Pine Valley; most prior to sagebrush treatment; 65-66 sightings of kit fox in Vanderhoff field of Curlew N. G. Mtn. lions in all mountain ranges of area, bobcats in ranges & in between
23. "	John Pratt, CO Utah Fish & Game Snowville UT	No kit fox sightings north of Snowville, but only there one year; many kit fox S of Snowville near Locomoter Springs

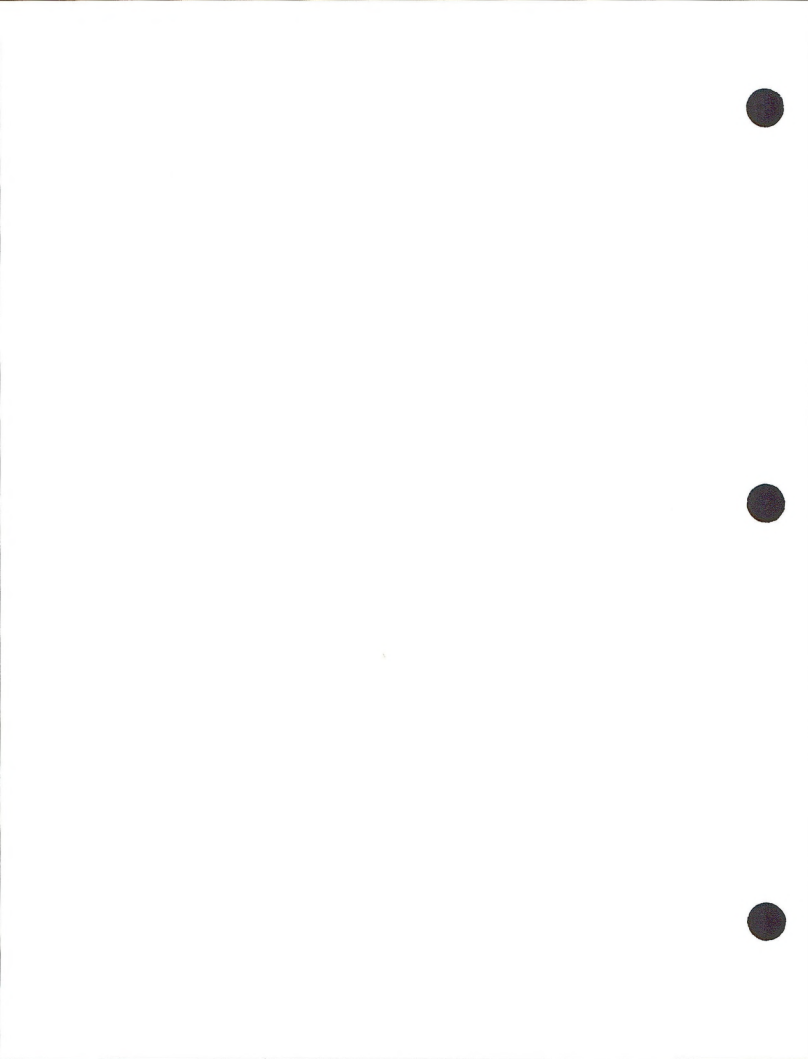


Table 1 cont.

Planning Unit	Observer	Information
24. Curlew & Malad Hills	Paul Clark, Ranger Curlew Natl. Grass. USFS Malad ID	Killed a lion SE of Malad in 1978; recent report of another in same area; lions in all other mtn. ranges of area; lynx about 20 yrs ago near Clarkston UT; no other reports
25. Malad Hills	C. E. Harris, Trapper Stone ID	No otters along Stone Reservoir or in P.U. Some bobcats but a lot less
26. " "	Roger Olsen, CO Idaho Fish & Game Malad ID	Has kit fox hide from road killed animal (Nov. '77) 3-6 mi S Cherry Creek S of Malad; lions in all mtn. ranges in area; bobcats common in the P.U.; no reports of otters
27. Pocatello	Tom Lucia, CO Idaho Fish & Game Preston ID	No kit fox sightings or reports, bobcats & lions, same general information as other contacts; reports of otters in Riverdale area on Bear River
28. " "	Lee Hunt Retired CO Idaho Fish & Game Preston ID	Most familiar with state lands in SE part of Pocatello P.U.; no kit fox or otter reports, same info. of lions & bobcats as others
29. " "	Bill Davidson Regional Supervisor Idaho Fish & Game Pocatello ID	No reports of otter in Portneuf River; no lynx reports in area; no kit fox; bobcats low in number but distributed thru-out P.U.; lions, 2 reported (1978) in upper Marsh Creek T11SR38E, 1 report NW of Rockland out of P.U.
30. " "	Dale Jensen Regional Game Mgr. Idaho Fish & Game Pocatello ID	No river otter reports or kit fox; same information regarding bobcats & lions as Davidson above
31. " "	Don Nicholson Supervising CO Idaho Fish & Game Pocatello ID	No river otter or kit fox reports, no lynx; bobcats distributed in area in rocky, broken habitat; lion in upper Walker Creek, T8SR35E



Table 1 cont.

Planning Unit	Observer	Information
32. Pocatello	G. Fagnant, Trapper Soda Springs ID	No otter in P.U. Bobcats common in Bannock Range
33. "	Richard Wonnacot Supervisor ADC, USFWS Pocatello ID	Gave essentially same info. as others on Pocatello P.U.
34. All P.U.'s	Ken Norrie Fur Biologist Idaho Fish & Game Boise ID	Bobcat harvest info.
35. All P.U.'s	W. Stephenson USFWS Trapper Logan UT (reporting after State trapper conf.)	No kit fox taken in Idaho but a few caught annually near Snowville & Tremonton UT; a few otters along Snake River; no info. on lynx; mtn. lions in Black Pine Mtns., Mahogany Butte (near Oakley), & near Rockland in Deep Creek Mtns. Bobcats used to be very plentiful but down considerably since increase of pelt value



Confirmed evidence of kit foxes in the Black Pine (Juniper) Valley is limited to one set of positively identified tracks observed by a USFWS employee while conducting their annual predator scent station survey (USFWS 1975). These tracks were found about 7 miles south of Juniper, Idaho. In addition, an unknown set of fox tracks was observed on this same transect the year before (USFWS 1974).

We conducted field searches throughout the Black Pine (Juniper) Valley, with special emphasis on the T16SR30E township. This area still contains a few localized areas of suitable kit fox habitat (i.e., greasewood-shadscale communities). Field searches resulted in no positive kit fox sign or individuals observed. Several "suspicious looking" burrow mounds (possible kit fox dens) and one den containing pups of an unidentified canid species were discovered in Section 8 of this township. Although one pup was observed by Tim and Erica Craig (WERA Raptor Biologists), no positive evidence indicating whether this was a kit fox, red fox, or coyote den was obtained. Our examination of this den three days after the pup was seen showed that the den had been abandoned. Exhaustive searches in this and surrounding sections failed to uncover another occupied den.

B. Stokes and W. Stephenson (1979, pers. comm., Table 1, #16, #17) have trapped predators in northern



Curlew Valley and the Black Pine (Juniper) Valley for 30 and 6 continuous years, respectively, and neither has captured nor heard of recent captures of kit foxes in these areas. Both, however, acknowledge their occurrence in nearby areas to the south and both speculate that kit foxes may also still occur in the Black Pine (Juniper) Valley. If present in the Black Pine (Juniper) Valley, they occur at a low density.

- 2) Malad Hills PU - Historical information documenting the presence of kit foxes in this PU is lacking. However, recent confirmed evidence, in the form of a road-killed kit fox along Interstate Hwy. 15 south of Malad City in November 1977 was documented (R. Olsen, Table 1, #26). Because the extent of agricultural development in the Malad Valley and therefore the lack of suitable habitat (McGrew 1979), we doubt if there is a resident population in this area. More likely, this animal was a dispersing young of the year from the south. Kit foxes are reported in the area S of Tremonton and Snowville, Utah (about 30 linear miles away), and McGrew (1979) reported that kit fox family groups break up in October.

K. Kimber (1979, pers. comm., Table 1, #22) reported a kit fox sighting in the Vanderhoff Blow Field on Curlew National Grasslands in 1965 or 1966. We conducted ground searches (spotlighting, sign searches, predator calling/binocular scans) in this area, and although no positive



sign of kit fox presence was observed, limited portions of this area appear to be suitable kit fox habitat, as described by McGrew (1979) and Egoscue (1956, 1962).

Management Recommendations - Although kit foxes historically occurred in the extreme southern portions of both the Curlew and Malad Hills PU's, it is unclear if they do so now on a regular basis. However, kit fox occupancy in recent years may be either dispersing foxes from areas to the south and/or a very low density resident population. A likely explanation for their demise in these areas is loss of habitat because of the influx of agriculture. Morrell (1975) reports that irrigated cropland and urban developments provide only marginal kit fox habitat. Current sporadic reports of kit foxes may be dispersing animals from a reservoir population south of Snowville, Utah.

A low density kit fox population is suspected to exist in the Black Pine Valley of the Curlew Planning Unit and possibly in the Curlew National Grasslands of the Malad Hills Planning Unit. However, because of land jurisdiction, the Bureau of Land Management should only be concerned with the Black Pine Valley population. Information concerning kit fox presence there in the past (until 1975) was obtained for the T16S R30E township and much of this is BLM administered land. As a result, we recommend that a continuing intensive survey of BLM lands in this township be conducted to obtain additional information on whether a remnant population still resides there, and if a resident population is found, to determine 1) ecological distribution limits, 2) areas of critical or essential habitat, and 3) estimates of population parameters. If additional



kit foxes are found or suspected, efforts should be taken to prevent loss of habitat and increase public awareness of the beneficial aspects of kit foxes by educational programs. Based on habitat requirements outlined by McGrew (1977), shrub communities in the areas where kit foxes are known or suspected should be protected from destruction by spraying and/or chaining operations. Since kit foxes are generally observed in areas of less than 20 percent ground cover, grazing or even overgrazing by livestock should have little or no adverse effects on either kit foxes or their main prey species (black-tailed jack rabbits and kangaroo rats). Areas where current kit fox presence is documented should be closed to predator trapping and poisoning, and to rodent control (poisoning).



River Otter

The mostly aquatic river otter (Lutra canadensis) historically ranged over most of North America (Murie 1954) but has been reduced or extirpated from much of its former range (Lechleitner 1969). The USFWS is presently reviewing the status of the otter in the United States, but because of lack of scientific data on its current distribution and abundance, no federal classification on its status has yet been made.

In Idaho, otters appear scattered but are widely distributed throughout much of the state. The Idaho Department of Fish and Game currently lists the river otter as a protected, nongame carnivorous mammal with no legal harvest allowed (Idaho Dept. Fish and Game 1978).

Habitat - River otters are well adapted to an aquatic existence and are seldom found far from water. They reside along larger creeks, streams, rivers, ponds, and lakes, and may travel many miles in search of food. Food habits incorporate a great variety of animals, including invertebrates, fish, amphibians, reptiles, birds, and mammals (Martin et al. 1951, Burt and Grossenheider 1964, Grenfell 1978).

Important habitat components include stream banks, islands, points of land extending into water, log jams, and large rocks in water (Mowbray et al. 1976, Murie 1954).

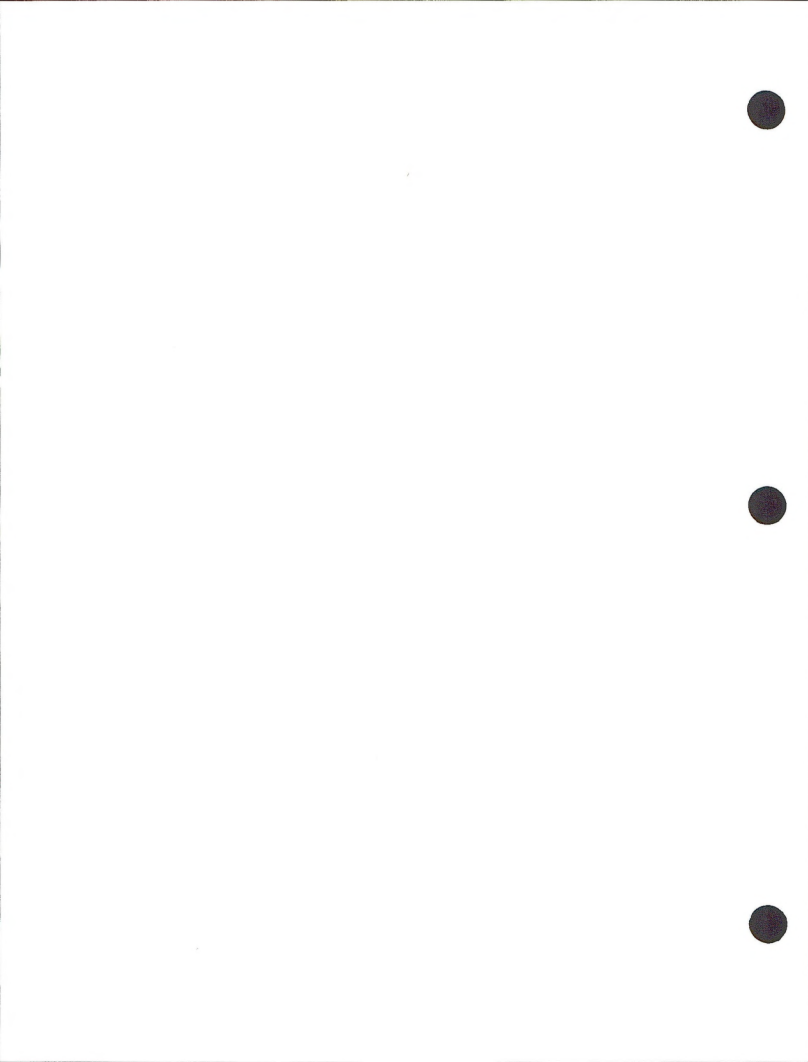
Methods - Two methods to document the presence or absence of river otters in the five PU's were utilized: 1) interviews with knowledgeable persons (previously described), and 2) sign searches.



Sign searches involved walking along likely water courses (e.g., creeks) and water bodies (e.g., lakes). Signs of otter presence sought included slides, haul-outs, bedding sites, rolling sites, scrapes, dens, tracks, scats, diggings, and scent posts (Murie 1954, Lechleitner 1969, Mowbray et al, 1976). These searches were conducted during different seasons but were concentrated during the winter and spring months when otter sign is most obvious.

Results - In general, otter distribution in the five PU's is confined to the Snake River proper and its numerous tributary creeks, although some exceptions were found. Evidence of otter presence was limited to sightings of individuals and to otter tracks and scats. No den sites, active or inactive, were found.

- 1) Twin Falls PU - The presence of river otters was documented in five localities within this PU.
 - a) Snake River - Otters appear to be distributed all along the Snake River in the Twin Falls area (Table 1, B. Webb #10, L. Finney #4, C. Gary #11).
 - b) Clover Creek - Otters are infrequently seen and accidentally trapped along this creek (Table 1, L. Finney #4, J. Underwood #7). No dates or more specific information on these sightings are available.
 - c) Salmon Falls Creek - All reports of otters on this creek come from along the canyon below Salmon Falls Dam (Table 1, L. Finney #4, J. Underwood #7, B. Webb #10). Numerous sign searches along the reservoir and upstream produced no otter sign. We suspect, however, that since otters inhabit the section below the dam, they may well reside at the reservoir and along the



creek above the reservoir, possibly irregularly.

This is further evidenced by otters being present in Shosone Creek (see below), a tributary whose confluence with Salmon Falls Creek is above the reservoir and by a trapped animal taken from the Jackpot area (drained by Upper Salmon Falls Creek and Shosone Creek).

- d) Shosone Creek - Otter presence here was documented by J. Brannon (Table 1, #15) and by tracks, scats, and feeding sites found on three different occasions by us. The timing of these sightings indicates year-round use of Shosone Creek by otters. Much of this creek is on BLM land. We also suspect otter presence in Big Creek, a tributary of Shosone Creek to the east. Examination of this creek produced no observations of otter sign but suitable habitat and adequate foods (fish and crayfish) appeared available.
 - e) Rock Creek - Otter presence in this creek was confined to two sightings: 1) two animals one mile south of Twin Falls (B. Gorgen, Table 1, #1) and 2) one animal near the Goose Creek confluence on Rock Creek (C. Gary, Table 1, #11).. Sign search along this creek on or near BLM land produced no signs of otters.
- 2) Curlew PU - Interviews with persons and sign searches along Deep Creek and Stone Reservoir produced no information indicating presence in this PU of otters. Persons interviewed felt that suitable habitat was lacking.



- 3) Malad Hills PU - Sign searches along the Little Malad River, Daniel Reservoir, Malad River, Deep Creek (east of Malad City), and Devil Creek (and Reservoir) and interviews with persons produced no sign or documented sightings of river otters in this PU. A possible report of an otter along the Little Malad River in 1979 was furnished by R. Olsen (Table 1, #26) but documentation was lacking.
- 4) Roy-Arbon PU - Information on otter presence in this PU was confined to unsubstantiated reports of otters along the Snake River west of American Falls and of one otter seen along East Fork of Rock Creek in 1976 (Table 1, W. Miller #18). The East Fork of Rock Creek is the only stream in this PU flowing yearround other than the Snake River, and otter presence along it is suspected to be irregular.
- 5) Pocatello PU - Interviews with persons throughout this PU and sign searches conducted along the Portneuf River (between Lava and Pebble) produced no information or sign of otters in this PU. The consensus among interviewees is that otters are not present in the PU.

Management Recommendations - River otters are potentially very mobile and often travel long distances along streams and rivers, and up feeder creeks to ponds and reservoirs or high mountain lakes. In contrast, they sometimes reside for long periods of time in a small portion of their home range (Melquist



and Hornocker 1979). Consequently, otter use of an area may vary greatly throughout the year and over several years, and they may be absent from a substantial portion of their range for extensive periods. These variations in habitat utilization are believed related to fluctuations in water conditions and changes in abundance and availability of food sources. This utilization pattern presents problems in accurately documenting otter presence and explains why interviews with knowledgeable persons were relied on so heavily.

We suspect otters may be present, at one time or another, along any creek, stream, or river, or any body of water fed by a creek, stream, or river, whenever a suitable amount of water and food are present. Melquist and Hornocker (1979) found otter density in central Idaho to approximate 1 per 2-3 km of waterway. Densities in our study area, based on the irregularity of water flows on many waterways, were considerably lower.

Much of the land administered by the BLM in these five PU's does not include habitat environmental features meeting habitat criteria described by Mowbray et al. (1976) and Murie (1954). Many of the waterways and water bodies are, in fact, under private ownership, although a few exceptions exist (e.g., Shosone Creek, Twin Falls PU). On these BLM administered lands where otter are documented or suspected or where suitable habitat exists, river otters can best be managed by:

- 1) Preventing loss of habitat by excessive reduction of stream flow or draw downs of water bodies for irrigation;

- 2) Preventing channelization of water courses;
- 3) Preventing destruction of riparian vegetation from excessive grazing; and
- 4) Preventing fur trapping along waterways where otters are known to reside.



Lynx

The lynx (Lynx canadensis) is primarily an animal of the boreal coniferous forest of northern North America. The abundance and distribution of lynx in Idaho is unknown. Small numbers are believed scattered throughout, but mostly confined to, the northern mountainous areas. Significant increases in pelt prices have resulted in considerably reducing certain populations in the state. The Idaho Fish and Game Department recently removed this species from the statutory predator list and classified it as a "species of special concern" (Idaho Dept. Fish and Game 1978).

Habitat - Prime habitat for the lynx is typically dense coniferous forests (McT. Cowan and Guiguet 1973) although mixed coniferous forests, edges, burns, and natural forest clearings from valley floor to timber line are also frequently used. Hall and Kelson (1959) and McT. Cowan and Guiguet (1973) both indicate this species is a creature of the forests and rarely ventures far from cover. In contrast, Hoffman and Pattie (1969) found that lynx are re-appearing in brushy badland and riparian forest habitat of central and eastern Montana where they were historically present in the 19th century.

Although many small mammal and bird species are eaten (Hall and Kelson 1959), the snowshoe hare is the principal food, and population densities are directly linked with the abundance of this prey species.



Methods - Information on the presence, abundance, and distribution of the lynx in the five PU's was obtained via interviews with knowledgeable persons. Considering the scarcity of this species in southeastern Idaho, it was not feasible to actually conduct sign searches.

Results - Evidence of four lynx observations was gathered.

- 1) Twin Falls PU - Three lynx were killed in 1973 in the Twin Falls area, but only two were actually taken within the Twin Falls PU.
 - a) One female was killed approximately six miles southeast of Hansen near Murtaugh Lake (Table 1, K. Daw #14). This animal was discovered in an agricultural field. The skin now hangs in Daw's Grocery Store in Hansen, Idaho, and was positively identified by C. Nellis, Research Biologist for Idaho Fish and Game, Jerome, Idaho.
 - b) One unknown-sex animal was killed near Castleford, Idaho, in an agricultural field (Table 1, T. Scheimeir #13).
 - c) One male was killed in an agricultural field on the north side of the Snake River, eight miles north of Hansen (Table 1, K. Daw #14).

Because all three of these animals were killed during the fall of 1973, all within a 20-mile area, it might be speculated that a litter of lynx was produced somewhere within the Twin Falls PU. The South Hills-Cassia Mountains



contains the most suitable habitat (McT. Cowan and Guiguet 1973) in the vicinity. The reason why all three were killed in agricultural fields is unknown.

- 2) Curlew PU - One animal was killed in Cow Canyon approximately 10 miles west of Holbrook in 1940 (Table 1, B.Stokes #16). This animal was taken in a coyote trap on BLM land.
- 3) Malad Hills PU - No reports of lynx in this PU.
- 4) Roy-Arbon PU - No reports of lynx in this PU.
- 5) Pocatello PU - No reports of lynx in this PU.

Management Recommendations - It appears that, in general, suitable habitat to support a population of lynx is unavailable in any of the five PU's, except possibly in the Cassia Mountains (South Hills) in the Twin Falls PU. Even here the occurrence of lynx is probably very irregular. Several trappers who have trapped the Cassia Mountains for years report no sign or captures of lynx there. No den sites were reported.

Because no populations of lynx were documented, no specific management recommendations will be made.



Bobcats

The bobcat (Lynx rufus), a southern equivalent of the more northernlynx, ranges from southern Canada through all of the contiguous United States. However, the bobcat is currently receiving unprecedented attention from state and federal wildlife agencies because of a noticeable decline in numbers beginning in the early 1960's (Nunley 1978). As a result, the USFWS is reviewing the status of this species as a possible candidate as an endangered or threatened species. Several reasons may have caused this decrease in bobcat numbers, including loss of habitat, fur trapping, predator control, and competition with coyotes.

Idaho maintains sizeable populations of bobcats and allows a limited harvest. The state recently removed this species from the statutory predator list and currently classifies it as a "species of special concern."

Habitat - The bobcat is a relatively common inhabitant of open, rocky, brushy foothills and canyon areas of the West (Lechleitner 1969). They also occur occasionally in forests or meadows. In southeastern and southcentral Idaho, bobcats are commonly found along the rocky canyons and throughout the numerous small ranges of mountains common to this region.

Food habits are varied and consist of many species of small mammals and birds. Hares (Lepus spp.) and cottontails (Sylvilagus spp.) are major prey items.

Methods - Information concerning the presence, abundance, and population trends of bobcats in the five PU's was obtained primarily from interviews with knowledgeable persons. A review of Idaho Fish and Game harvest records of bobcats between 1978-1980 was also conducted. In addition, several field search techniques were employed in localized areas to supplement interview information. These techniques included spotlighting on unimproved roads, track searches, predator calling/binocular scans, and scent station surveys.

Results - The presence of bobcats was documented in each of the five PU's and was, in general, widespread in each wherever suitable habitat was found.

- 1) Twin Falls PU - Documented reports of bobcats come from throughout this PU, but by far, the majority came from two specific areas.
 - a) Along the Salmon Falls Creek drainage (the canyon and nearby rolling hills).
 - b) In the foothill area surrounding the Cassia Mountains (South Hills) (Table 1). Much of this area is land administered by the BLM.

Field survey techniques resulted in confirmed evidence of bobcats along Shosone Creek in the southern portion of this PU. This evidence came in the form of tracks from two individual bobcats. A scent station survey conducted along the western foothills of the Cassia Mountains (South Hills) produced no evidence of

bobcats. Five nights of spotlighting resulted in no sightings of bobcats.

Trapping records for bobcats taken from the Twin Falls PU come from harvest information for three Management Units, #46, #47, and #54 (see Idaho Fish and Game Management Unit Map, Appendix I) (Table 2). The Twin Falls PU comprises only a small portion of these three Management Units, so many of the harvested bobcats were undoubtedly taken outside the PU. Still, some trend information on the harvest of bobcats in this area can be gleaned from these data. The number of bobcats taken in these Management Units in both 1979 and 1980 is from two to six times greater than those of 1978.

- 2) Curlew PU - The presence of bobcats in this PU is again widespread, with concentrations of documented observations occurring in three specific areas.
 - a) Along the lower eastern slopes of the Black Pine Mountains.
 - b) On the juniper slopes of the southern Sublette Range (between Holbrook and Juniper).
 - c) At the southern end of the Deep Creek Mountains, 10 miles north of Holbrook.

Much of these areas are on BLM administered lands. This information was provided entirely from interviews (Table 1). A scent station survey conducted between Holbrook and

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Table 2. Bobcat harvest data for the five Planning Units and surrounding areas.

Management Unit	Planning Unit	Year			Total
		1978	1979	1980	
#46	Twin Falls	4	24	18	46
#47	Twin Falls	4	7	11	22
#54	Twin Falls	8	26	21	55
#56	Curlew	8	13	19	40
#57	Curlew	3	5	12	20
#70	Pocatello	3	5	6	14
#71	Pocatello	2	9	12	23
#73	Malad Hills	14	25	24	63
#73A	Roy-Arbon	3	1	6	10
#74	Pocatello	<u>12</u>	<u>22</u>	<u>17</u>	<u>51</u>
Totals		61	137	146	344

*See Idaho Fish and Game Management Unit Map (Appendix II) for location of Management Units.



Juniper resulted in only one possible set of bobcat tracks. Spotlighting and predator calling/binocular scans conducted throughout produced no visual sightings of bobcats.

Trapping records for this PU are summarized in Management Units #56 and #57 (Table 2). These Management Units contain a larger area than just this PU and some of these harvested animals no doubt came from outside the study area. A steady increase in bobcat harvests, although of less magnitude than that for the Twin Falls area, can again be seen.

- 3) Malad Hills PU - Bobcat presence was found throughout this PU but concentrated in three areas.
- a) Along the North Promontary Range southeast of Holbrook.
 - b) Throughout the Blue Springs Hills west and south of Pleasantview and Samaria.
 - c) Most importantly, throughout the entire Bannock Range which forms the northern, eastern, and northwestern boundary of this PU.

Well over half of this area is on BLM administered land.

Field searches (spotlighting and predator calling/binocular scans) produced no sighting of bobcats.

A review of trapping records for Management Unit #73, which corresponds closely to the confines of this PU, shows that more bobcats were taken from this Management Unit than from any other one ($n=63$) (Table 2). The trend of increased



harvests of bobcats in 1979 and 1980 over 1978 is again apparent.

- 4) Roy-Arbon PU - Bobcat distribution in this PU is sparse but closely associated with the Deep Creek Mountain Range. This range runs north and south through the center of this PU and most of the observations come from eastern foothills along Arbon Valley and the western foothills along Rockland Valley. Nearly all of the Deep Creek Range is on BLM administered lands.

Because of limited access, all information on bobcats in this PU was obtained via interviews and review of trapping records. Management Unit #73A encompasses this PU and shows relatively few bobcats taken in the last three years (n=10) (Table 2). Interview information showed bobcats to be scarce in this PU and this is supported by the harvest records.

- 5) Pocatello PU - All information concerning bobcat distribution and abundance in this PU was gathered via interviews and from trapping records. Numerous bobcat reports come from throughout this large PU. However, concentrations of sightings come from three areas.

- a) The northern portion of the Bannock Range west and south of Pocatello.
 - b) Throughout the Portneuf Range east of Interstate Hwy. 15 and Hwy. 91 from Inkorn to Swan Lake.
 - c) Along the Fish Creek Range east of Lava Hot Springs.
- Most of this land is privately or state owned or administered



by the US Forest Service Caribou National Forest except for the Fish Creek Range, which is mostly BLM land. Only a few reports come from the Pocatello Range east of Pocatello.

Trapping records of bobcats taken in this PU come from Management Units #70, #71, and #74. A total of 88 bobcats have been harvested from this PU in the last three years (Table 2). Both the 1979 and 1980 harvests are over twice those of 1978.

Management Recommendations - Bobcats are widely distributed and relatively common throughout each of the five PU's. Distribution appears closely associated with the rough terrain along the foothills of the numerous semi-arid, small ranges of mountains found in south-central and southeastern Idaho. Apparently, these ranges provide preferred habitat for bobcats, but obviously, some individuals are found scattered in less preferred habitat and at lower population levels throughout southern Idaho. No active or inactive den sites were reported or discovered. It would be impossible to estimate population sizes or densities of bobcats in the five PU's from results obtained in this study.

Some information on population trends was gathered from both interviews with knowledgeable persons and Idaho Fish and Game harvest reports. Many of the local trappers, several biologists, and a fur dealer all indicated that increased trapping pressure, the result of inflated pelt prices over the last two years, has caused a considerable reduction in bobcat populations in southern Idaho. Whether this is



Actually the case is unknown. Table 2 shows that in the past two years harvests of bobcats have more than doubled annually from 1978, but it does not show that increased trapping pressure has seriously reduced populations or that populations have even seriously been reduced.

The harvests of bobcats is strictly controlled by the Idaho Department of Fish and Game by 1) employing a short trapping season, 2) stringent tagging procedures, and 3) rigid purchasing and export laws. Controlling harvests of bobcats is obviously one means of managing bobcat populations. Close communication with Idaho Department of Fish and Game should be maintained and localized area closures to harvest might be recommended if supporting data indicate that population levels are significantly reduced.

Some support for a nationwide reduction on bobcat population levels has been reported by Nunley (1978) but for different reasons. Nunley feels that during the 1950's bobcat populations were abnormally high because of intensive coyote control programs. The present reduction in bobcats, which began in the 1960's, is an inverse reaction to increased coyote populations. In short, coyote numbers are a major limiting factor for bobcat populations, and decreased control of coyotes over the last 15 years (because of unavailability of poison 1080) has led to decreased bobcat population levels. Furthermore, habitat loss, fur trapping, and direct losses from predator control are of minor importance. In conclusion, Nunley states that current bobcat populations appear to be in line



with those levels prior to the use of 1080 poisons, that they were in no danger at that time, and that they should not be considered endangered now. However, a measure to maximize bobcat populations would be to reduce coyote numbers.



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SPOTTED BAT

This report describes the results of a survey for presence or absence of a rare bat, Euderma maculatum (spotted bat or pinto bat). Until 1965, only 35 specimens of this species were reported in the open literature. Subsequently, most specimens that have been taken have been released by investigators, but an exact count of all specimens ever taken probably does not exceed 150. This species was listed as rare on the Bureau of Sport Fisheries and Wildlife Rare and Endangered Species List of 1968, and in the Red Data Book, (IUCN, 1969). Survey efforts were undertaken in August and September, 1979 and May, 1980 on or near lands administered by the B.L.M. in Southern Idaho. All subsequent nomenclature is after Jones, et al. (1979).

Habitat - Distributional records of the spotted bat have been summarized for Montana: Nicholson (1950), Wyoming: Mickey (1961), Utah: Easterla (1965), New Mexico: Constatine (1961), Texas: Easterla (1973), Mexican State of Queretaro: Schmidly and Martin (1973), Arizona: Poche (1975), California: Medeiros and Heckmann (1971), Nevada: Hall (1935), Idaho: Tucker (1957), and Oregon: Cross (undated) - Mickey Springs, T33S, R35E, S13, Harney Co., Oregon.

Euderma maculatum has been collected most often in desert terrain that is rough and dry (Watkins, 1977) and although Vorhies (1935) and Hardy (1941) suggested that the species might be found in caves, Easterla (1973; 1976) and Poche and Ruffner (1975) suggest that the



species normally roosts in rocky crevices of canyon and cliff walls. No voucher specimens have ever been prepared from cave sightings. Additionally, specimens obtained prior to collections made by Easterla (1965; 1970; 1973; 1976), Finley (see Fig. 2, Snow, undated), or Poche and Bailie (1974) suggested that investigators have collected solitary wanderers (Handley, 1959). In general, this bat has been collected in desert to montane coniferous forests (Jones, 1965). However, at present it is not clear whether individuals that have been collected in Idaho, Oregon, and Montana are members of resident breeding populations, or are post-breeding wanderers. The single Idaho specimen reported by Tucker (1957) was collected 15 miles southwest of Caldwell, Canyon County, where it had landed, apparently exhausted, on a driveway. Tucker suggested that the individual may have been "carried beyond its more southern habitat" following two days of high winds.

Methods - Thirteen localities (Table 1), three in the Bannock, three in the Curlew, and seven in the Twin Falls Planning Units, were sampled by mist-netting procedures, observation, dust shooting with a 410 gauge shotgun, or detection with a bat monitor, an ultrasonic (echo location) detection system available through Westec Service, Inc., San Diego, California. All bats were released at the site of capture except where individual validation specimens were required.

Seven areas were selected due to the presence of small ponds or water impoundments that could be easily netted; two were selected due to the presence of cliffs adjacent to water (Salmon Falls Reservoir); three were selected due to potential roosting sites (cave or caverns) as suggested by L. Parsons (B L M); whereas the remaining locality (S24, T12S, R15E) was selected due to the presence



Table 1. Locations and sampling intensity for bat collections undertaken in the Pocatello, Curlew, and Twin Falls Planning Units, Burley District, Bureau of Land Management. Samples were taken in August or September, 1979 or May, 1980.

Quarter	Section	Township	Range	County	Location	Method & Duration
NE 1/4	6	T16S	R30E	Oneida	Private Pond	Net once, dusk to dawn
NW 1/4	14	T16S	R30E	Oneida	Cattle Pond	Net once, dusk to dawn.
SE 1/4	10	T9S	R38E	Bannock	Private Pond	Net - 2 evenings
SW 1/4	17	T7S	R35E	Bannock	Private Water Impound- ment	Net - dusk to dawn - 3 nights
NW 1/4	27	T7S	R36E	Bannock	Sewage Settling Ponds	Net, 1 evening Dust shot, 2 evenings
SE 1/4	9	T14S	R30E	Oneida	Glen Canyon Springs	Sample tunnel with bat detector and net, dusk to dawn stock tank
NW 1/4	6	T13S	R17E	Twin Falls	Caverns, cracks in cliffs	Extensive search of cliffs with bat detector
NE 1/4	7					
SE 1/4	18	T14S	R15E	Twin Falls	West Bay, Salmon Falls Creek	Dust shot, 1 evening
NE 1/4	18	T14S	R15E	Twin Falls	Head, Salmon Falls Dam	Observation, 1 evening
NW 1/4	4	T12S	R15E	Twin Falls	Berger Reservoir	Net, 2 evenings
SE 1/4	11	T14S	R15E	Twin Falls	Private Ponds	Net once, dusk to dawn
SW 1/4	24	T12S	R15E	Twin Falls	Gravel Pit	Net once, dusk to dawn



an extensive moth population. Easterla (1965), Ross (1967), and Easterla and Whitaker (1972) have suggested that the diet of E. maculatum is largely restricted to noctuid moths although Poche and Bailie (1974) have provided a limited documentation of other insects taken by non-captive individuals.

Netting was conducted from dusk to dawn at six locations. Since a limited bat fauna was observed or taken in the Twin Falls Planning Unit during the summer of 1979, three long-term and three short-term residents of the Clover area were interviewed about the occurrence of bats around their homes or farms. Individuals contacted included:

<u>Name</u>	<u>Years at Location</u>
Edgar Meyer	61+
Ray Ohlenseitzler	35
Edna Baker	40
Eric Wegner	10
Luther Baker	3
Pastor Löesel	3

Results - No specimens of Euderma maculatum were observed or collected. Two residents of the Clover area had seen bats, Edgar Meyer on his farm and Edna Baker in the Cedar Creek Area, both only as children. Bats known to occur in the planning units, as established in literature (Whitlow and Hall, 1933; Davis, 1939) by specimens deposited in the Idaho Museum of Natural History, Pocatello, or collected during preparation of this report include: Plecotus townsendii (Townsend's Big-eared Bat), Myotis lucifugus (Little Brown Myotis), Myotis yumanensis (Yuma Myotis), Myotis evotis (Long-eared Myotis), Myotis leibii (Small-footed Myotis), Lasionycteris noctivagans (Silver-haired Bat), Pipistrellus hesperus



Western Pipistrelle), Eptesicus fuscus (Big Brown Bat), Lasiurus cinereus (Hoary Bat) and Anthrozous pallidus (Pallid Bat).

Management Recommendations - Although our limited sampling has failed to establish the presence of Euderma maculatum within the Pocatello, Curlew, or Twin Falls planning units, the only significant cliffs that might serve as habitat for this bat exist around Salmon Falls Dam. This area should be re-evaluated if spotted bats are located in the central portion of the Burley District of the B.L.M., now under investigation.

- 1) Re-evaluation efforts should include both summer and winter sampling, as Ruffner, et al. (1979) have recently netted the spotted bat in freezing or near freezing weather conditions in southwestern Utah. Further, netting should be conducted from dusk to dawn, as Euderma maculatum is usually a late night flyer.
- 2) Water impoundments would only be beneficial to spotted bats located in cliff habitat. In the planning areas, water is already impounded in areas containing cliffs. Thus, further impoundments cannot be justified for this species, should a breeding population actually reside in the area.
- 3) Judgements concerning the presence or absence of this species should be reserved until the entire planning unit has been surveyed. Since the species is considered rare, any habitat in which it is found should not be innundated with water.
- 4) Bats are highly beneficial mammals, destroying large

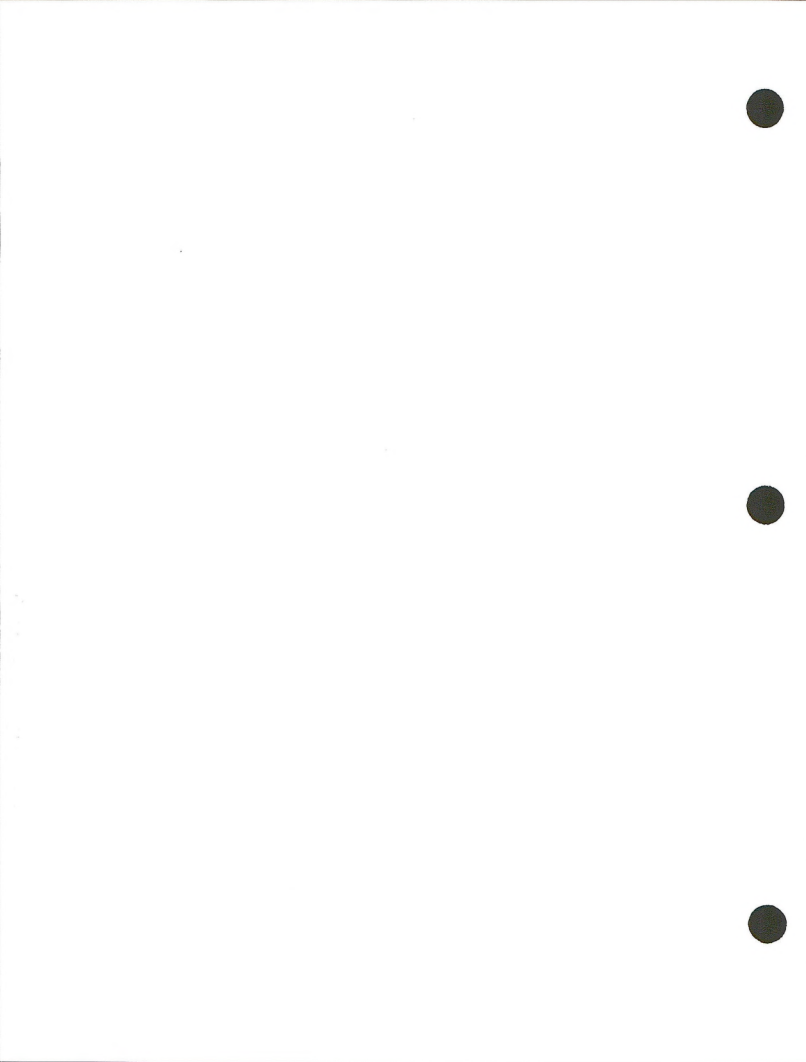


numbers of insects. Where colonies occur in the Burley District, they should be protected. Management for non-rare species might include water impoundment in small ponds. Additionally, abandoned mine shafts or tunnels should not be dynamited closed. The mouth of such structures could be partially fenced to prevent human entrance but allow bats free passage.

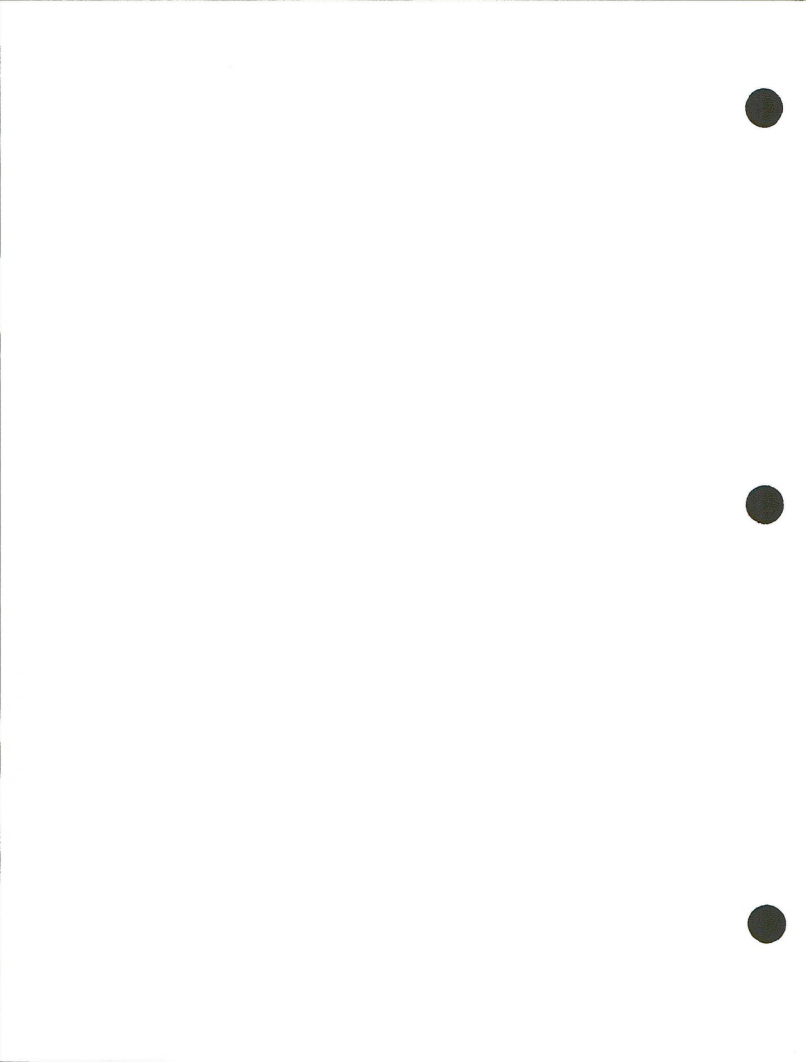


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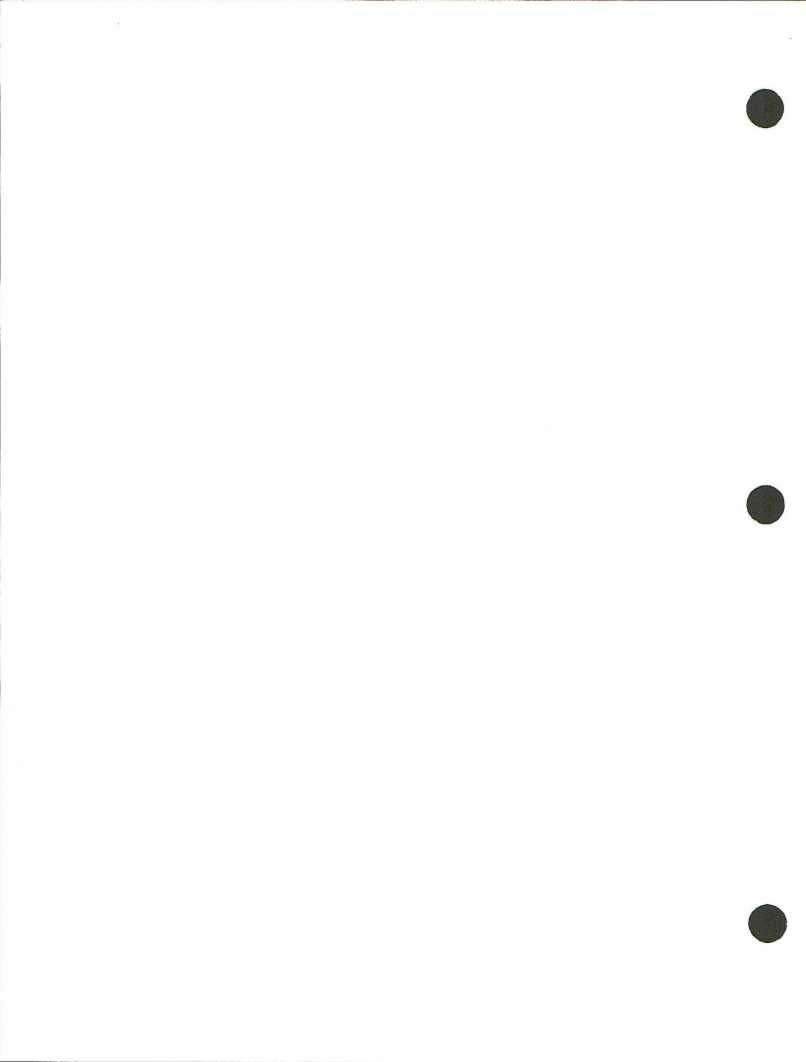
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PYGMY RABBIT

The pygmy rabbit (Brachylagus idahoensis) is a small leporid (500 g - 1 lb) that is a game species in Idaho, California and Nevada, has protected status in Washington, and is not protected in Montana, Utah and Oregon (Fisher and Keller, in press). Green and Flinders (1980) have recently reviewed the taxonomic designation of the pygmy rabbit and have removed the species from the genus Sylvilagus. The upper parts of this rabbit are pinkish to blackish or dark grayish, but pelage color varies with the amount of wear.

Wilde (1978) has completed an extensive 2½ year study of the population ecology of pygmy rabbits on the Idaho National Engineering Laboratory Site while Fisher (1979) was completing his study of reproduction by necropsies of reproductive organs. Both Wilde (1978) and Green and Flinders (1980) have analyzed the diet of this species. In general, adults breed from February to June and females produce 13 young (mean litter size 6.0), annually. The reproductive potential of B. idahoensis is lower than most lagomorphs, a condition that has not been considered in the management of this species. Little was known about the biology of B. idahoensis until the late 1970's.

Habitat - Pygmy rabbits are the only North American leporid that burrows. They are found in stands of tall big sagebrush (Artemisia tridentata) which appears to be the most important item in the diet, especially during winter when it accounts for over 80% of the food intake (Wilde, 1978; Green and Flinders, 1980).

In Idaho this species is found in areas along washes and



springs where sagebrush is dense (Keller, unpublished), in draws and on the lee side of hills and lava fronts. Green and Flinders (1980) suggest that cover is a critical habitat feature and that the height of woody vegetation is selected by individuals. Burrows tend to be located in the deep sandy soils, often at the base of individual sagebrush plants. Weasels (Mustela frenata), coyotes (Canis latrans), and raptors are known to prey on B. idahoensis.

Management Recommendations - This leporid appears to be unable to respond to changing environmental conditions, especially destruction of tall dense stands of big sagebrush. Fisher and Keller (in press) have suggested that current grazing and farming practices are rapidly reducing the habitat required by this species. Management for B. idahoensis should include protection of areas of dense woody vegetation and it is reasonable to expect, based on the amount of information that is now being accumulated on this species, that a change in the bag limits or even a protected status for this small rabbit will be developed in states such as Idaho.



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SAGEBRUSH VOLE

The sagebrush vole (Lagurus curtatus) is a small rodent that is found in the western United States, having spread from the Great Basin on to the northern Great Plains through non-forested connections established in the Holocene (Hoffmann and Jones, 1970). Adults weigh from 17 to 38 g. (1 oz.) and are about 12.0 to 13.0 cm in total length. In Idaho, the species is characterized by a short tail of about 2.0 cm in length, the pelage is long, the bases of hairs plumbeous gray. The upper parts are pale buffy gray to ash gray. Sagebrush voles appear to breed continuously after reaching maturity, at least in the central portion of their range (Maser et al., 1974). Little is known about the habits of this rodent in Idaho, however.

Habitat - Colonies of sagebrush voles are usually located in areas dominated by sagebrush (Artemisia spp.) rabbitbrush (Chrysothamnus spp.) and bunch grasses, especially crested wheatgrass (Agropyron spp.). Maser et al., (1974) have emphasized the importance of sagebrush as cover, and Artemisia may constitute a major food item, especially during October through January. In general, L. curtatus is restricted to semi-arid prairies, rolling hills, or brushy canyons with loose, well-drained soils (Carroll and Genoways, 1980). Keller (unpublished) has collected individuals in dense sagebrush on flats near Pocatello, however.

Sagebrush voles are distributed along the east edge of California to western Utah, north to central Washington, east across the central and southern portion of Idaho, northeast through central Montana into Canada and far western North Dakota, and



south through most of Wyoming into the northwestern edge of Colorado. In spite of the broad range of this rodent, few investigators have documented annual changes in density of individual colonies or the impact of altering the environment on these densities (cf. Hall, 1928; Soper, 1946; Banfield, 1974).

Management Recommendations - Although this species might seem to be of limited economic value, it is an important food item in the diet of Burrowing Owls (Speotyto cunicularia). Maser et al., (1971) have established that L. curtatus may constitute 25% of the diet of this species. Since the Burrowing Owl occurs on the Burley District and is considered a sensitive species, extensive stands of sagebrush adjacent to known owl habitat should not be totally eliminated.

The following studies would be of scientific merit, and should be undertaken prior to further reduction in sagebrush habitat, especially near known Burrowing Owl locations on the Burley District.

- 1) A one-year study of fluctuations in density of sagebrush voles, including an analysis of the minimum habitat islands necessary to maintain colonies.
- 2) An analysis of the diet of Burrowing Owls, especially on land adjacent to sagebrush habitat.
- 3) An analysis of the diet of sagebrush voles, especially those residing adjacent to crested wheatgrass plantings.



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ROCK SQUIRREL

The rock squirrel (Spermophilus variegatus) is a small shy mammal that is distributed throughout the southwestern states and into northern Mexico. It is described as a foothills species and is typically found between 5,000 to 8,500 feet elevation. These animals are rarely seen in open valleys. Their taxonomy is unclear and they are also sometimes listed in the genus Citellus (Durrant, 1952). There are several proposed subspecies which apparently intergrade making field identifications somewhat arduous (Armstrong, 1952; Durrant, 1952). This condition is reflected by the species name (variegatus) which is carried over by authorities even though there is disagreement concerning the generic name.

Rock squirrels are large in comparison to their close relatives and weigh from 600-750 g (1.5-1.75 lbs). They are roughly 45 cm in length with the tail comprising slightly less than half (20 cm) of the total length. They present a dappled appearance with the upper parts a variegated mixture of pinkish buff, white and brown. Under parts are white to buff colored and the animals have a conspicuous light eye ring.

Habitat - Rock squirrels prefer shrub communities which provide both food and cover. They are most frequently found in or near areas having numerous rocky outcroppings. Their secretive habits and alert posture make them difficult to approach.

Rock squirrels are distributed along the Wasatch Range of central Utah, westward into Nevada, eastward into southwest and central Colorado and south throughout much of New Mexico and Arizona into Mexico. Their range extends into Idaho in the



Malad Hills P.U.

We did not observe these animals during the study but contacted two persons who have made positive identifications. Mr. Frank Renn collected one specimen in Wood Canyon northeast of Holbrook approximately ten years ago. R. Olson has made several sightings including two recorded observations in Weston Canyon and Dry Creek during 1979 and at Cherry Springs in the spring of 1980. He has also seen several of these animals in the Oneida Narrows area along the Bear River-although this is outside the Burley District.

Management Recommendations - Since this species is limited to a small fraction of the Burley District it is improbable that it should receive significant attention. However, in those areas where it is known to occur its presence should be carefully weighed prior to implementing measures to reduce or alter the vegetation cover. This is particularly true of any future efforts to reduce or eliminate shrub cover in the foothill communities of Wood and Weston Canyons and along Dry Creek and Cherry Springs. The decision making process should include intensive efforts to determine the status of these mammals in any of these areas prior to implementation of any control practices.



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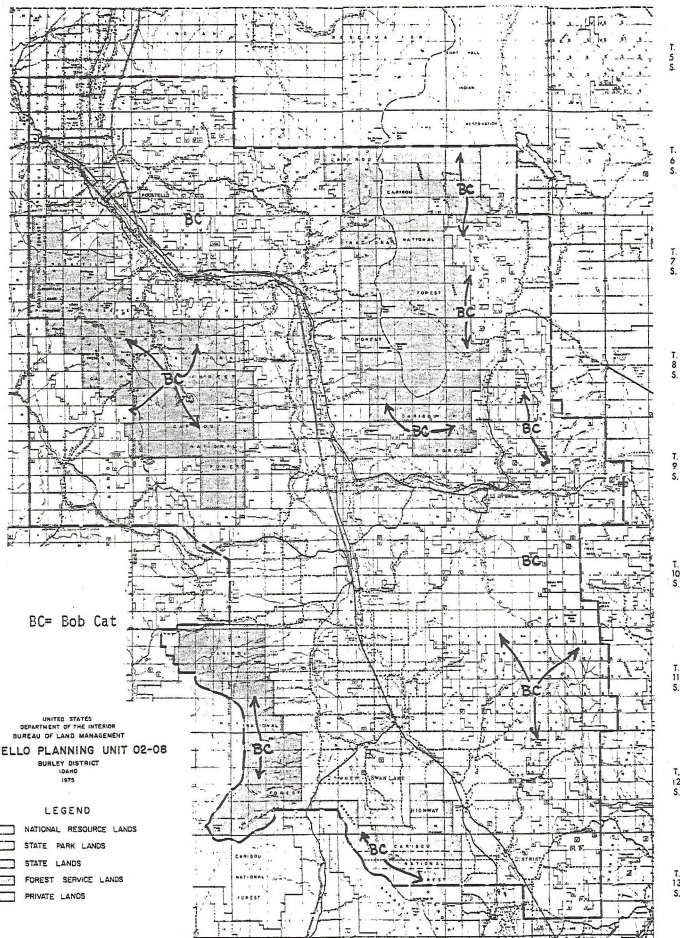
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APPENDIX I

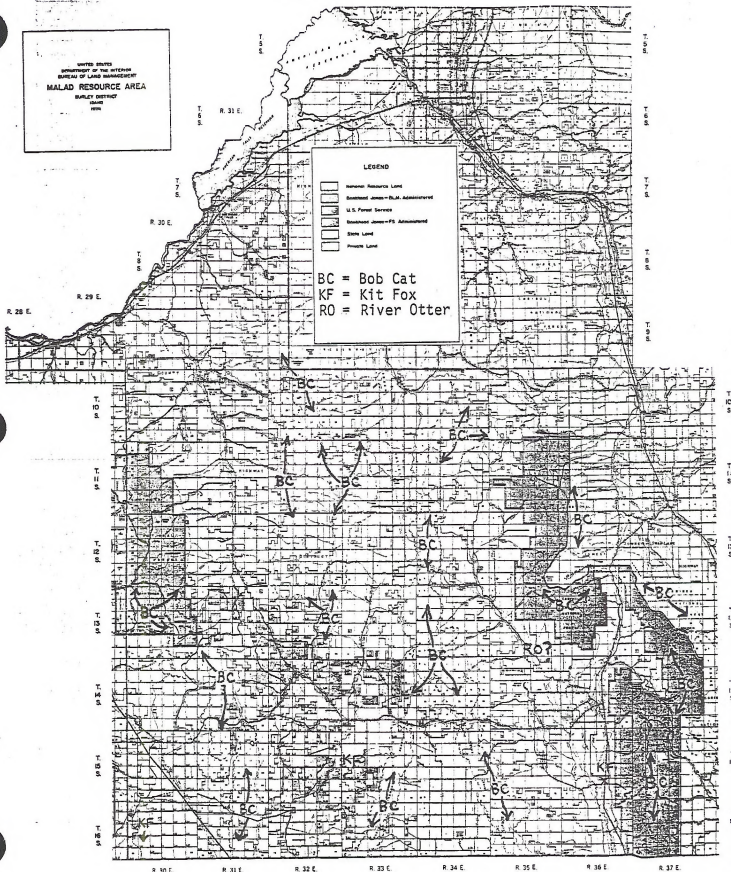
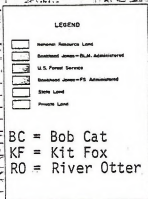
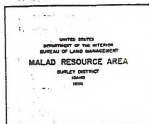
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OF CARNIVORES







R. 32 E. R. 33 E. R. 34 E. R. 35 E. R. 36 E.



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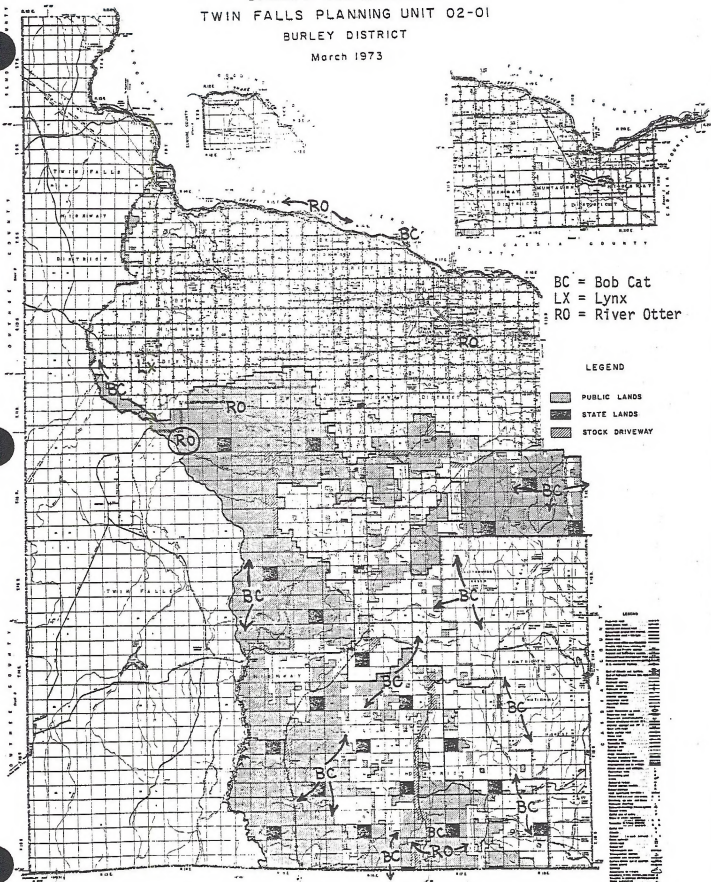
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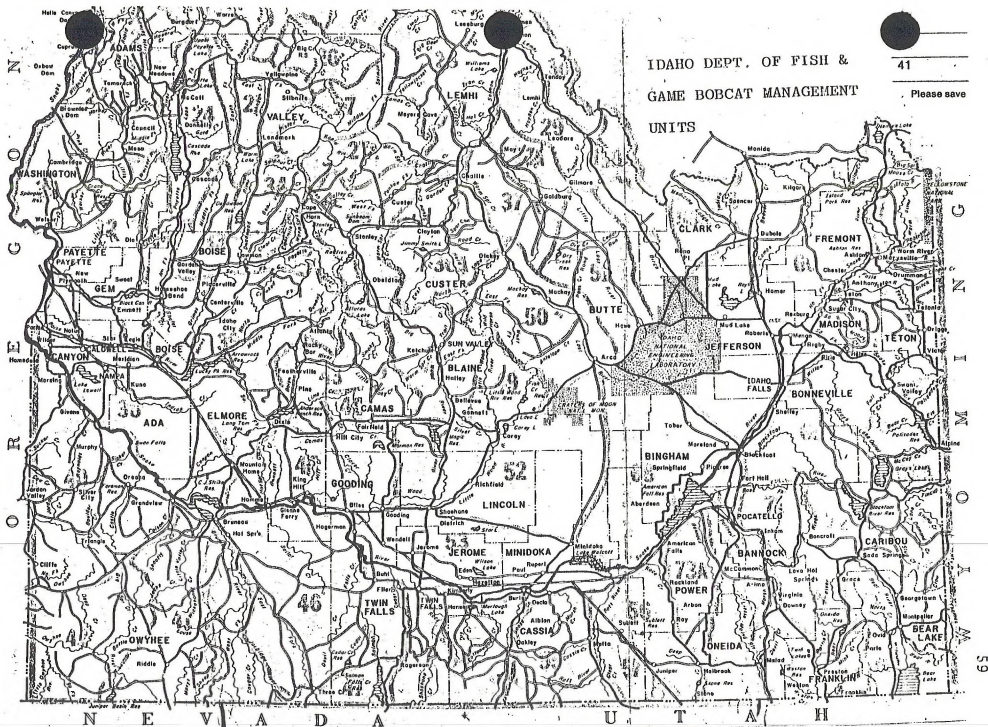
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